Appendix D (Continued)

Numbers tend to have wide-ranging functions. They are a key element in billing. They can relate to credit card usage. They appear in television presentations if the story line so dictates, often as 555-2368 to avoid nuisance calls to "real" numbers serving public users. The relatively new "800" toll free usage has spawned an extraordinary interest in spellable numbers, primarily to gain mnemonic marketing advantages.

The called number, of course, is only one of two numbers in a typical call. The calling number has functions of its own. Nuisance calling has long been a problem largely unsolved until calling numbers could be carried along signaling paths. Now services influenced by both calling and called numbers are commonplace. Call forwarding, for example, can be made selective, the decision to forward depending on the calling party's number. The issue of privacy has been prominent in debates on possible use of the calling party number. In some cases two calling numbers may apply to the same subscriber, one for billing, the other for DDD call-back. A WATS line has no return-call number in the ordinary sense.

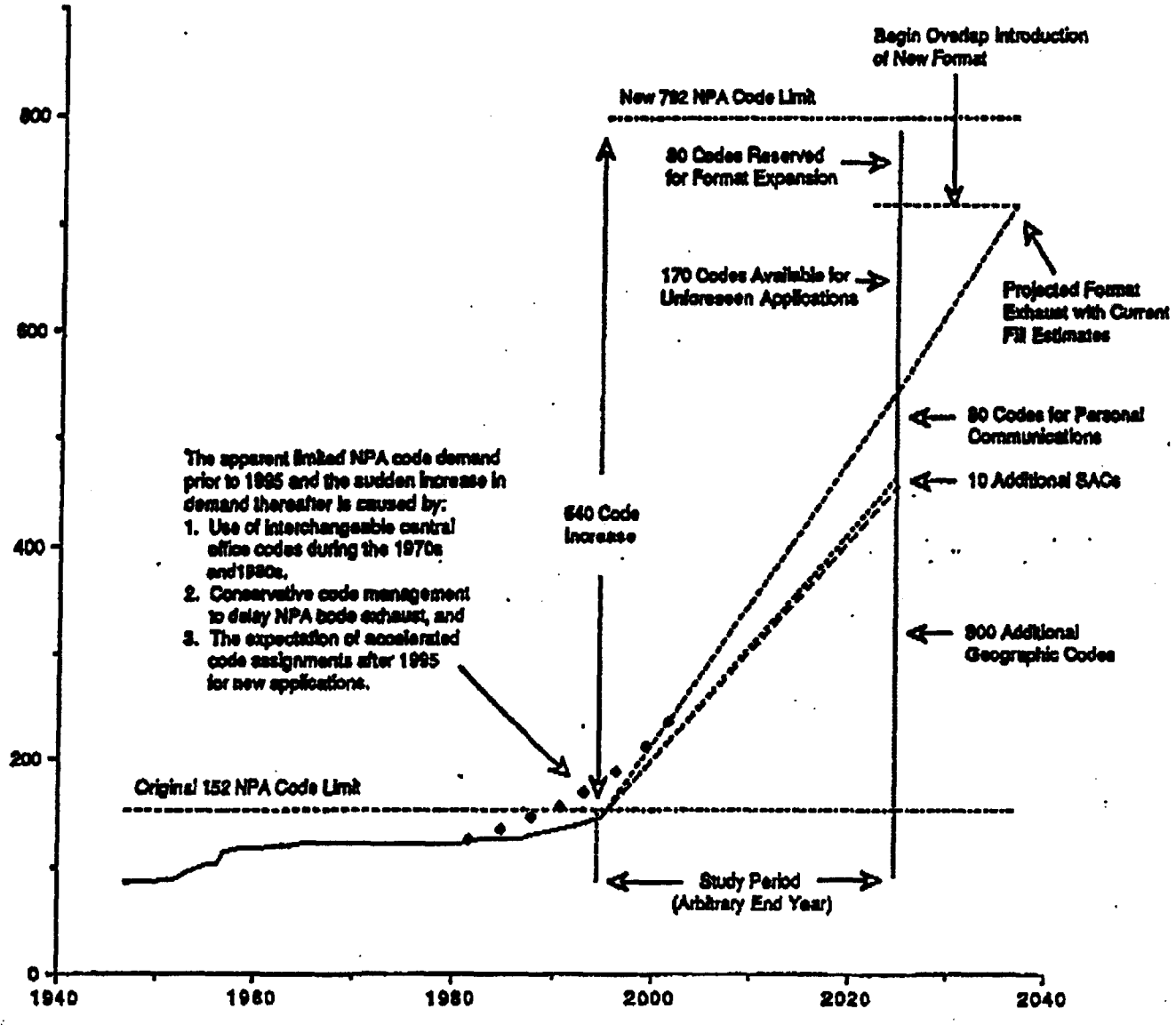
Numbers applied to communications networks have typically been key factors in routing and charging. Both fixed and mobile stations are commonly served by numbers that participate in these traditional roles. Personal numbering appears likely to change the linkage, but routing and charging must still be accounted for, indirectly if not directly. The advent of ISDN resolved a different aspect of the routing problem. With ISDN connections involving a choice of transmission facility type, a statement of the caller's preference is needed. In general, a mandatory new input called the bearer capability meets this need without the usual recourse to numbers. A special button or the terminal itself could supply this input. An alternative with conventional dialing requires the three leading touch-tone signals (#56) followed by North American standard formats to establish a request for 56kbps Public Switched Data Service (PSDS). An application of numbers to dialing is also a basic part of equal access. The format 10XXX (to be expanded to 101XXXX) permits the selection of a particular interexchange carrier when the default choice is to be overridden.

It would be presumptuous to try to assemble a complete listing of numbers and their uses. What must be accommodated realistically is a basic set of dialable input choices to cover services offered from fairly simple terminals. As services grow in complexity, protocol structures will expand to allow feature requests by specialized keys. Discussions comparing stimulus and functional signaling have already shaped part of the future in ISDN. What must command attention is not so much the varieties of service, but the risk of large, unexpected multipliers. The numbering plan can expand, if advance warning is sufficient, but change on a continental scale takes both time and careful planning.

For new services based on new protocols in which the destination number and supporting information are always sent en bloc, one traditional problem should disappear. The end of dialing will always coincide with receipt of the en bloc address. Operator dialing offered KP and ST as multifrequency control characters. DTMF has the #, mandatory with equal access cut-through based on 10XXX#, but until the last rotary dial (DP) is retired, basic services otherwise accessible from a device with a rotary dial (DP) will remind us that the old yields to the new, but not easily nor quickly nor completely.

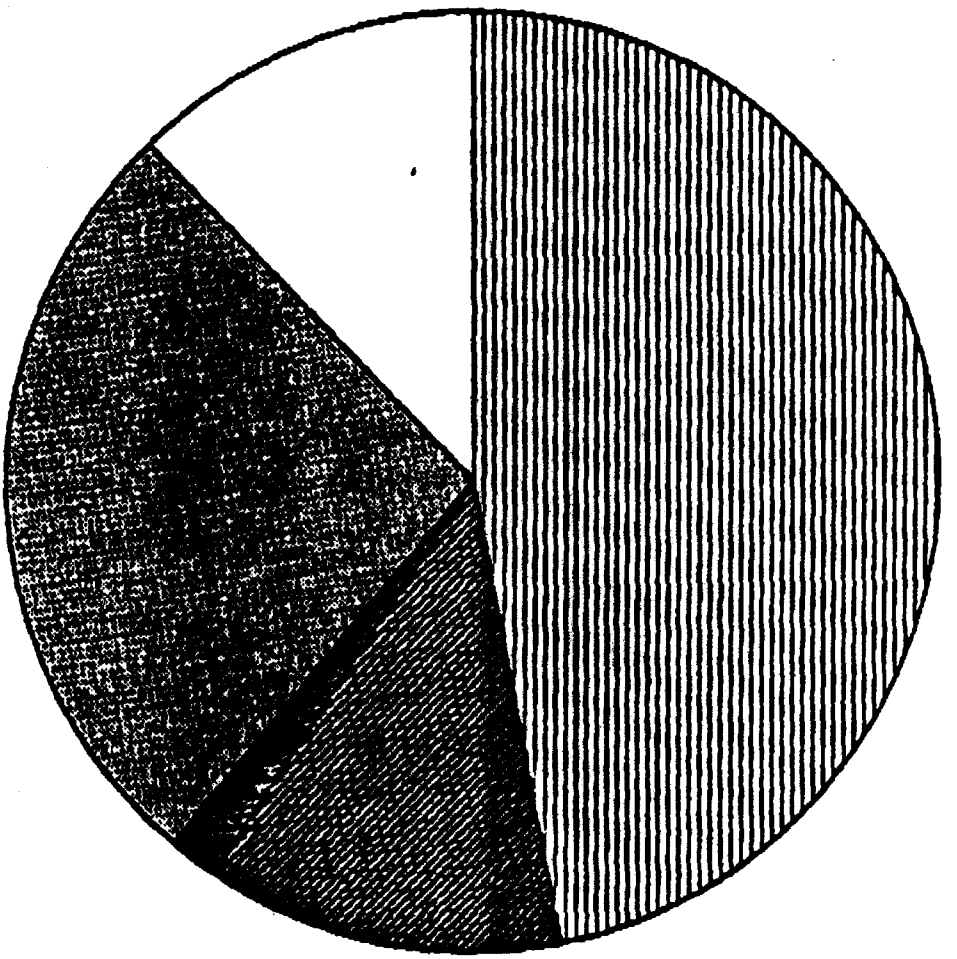
Appendix E

NANP Capacity Allocation Projection



Appendix E (Continued)

Allotment of 640 New NPA Codes



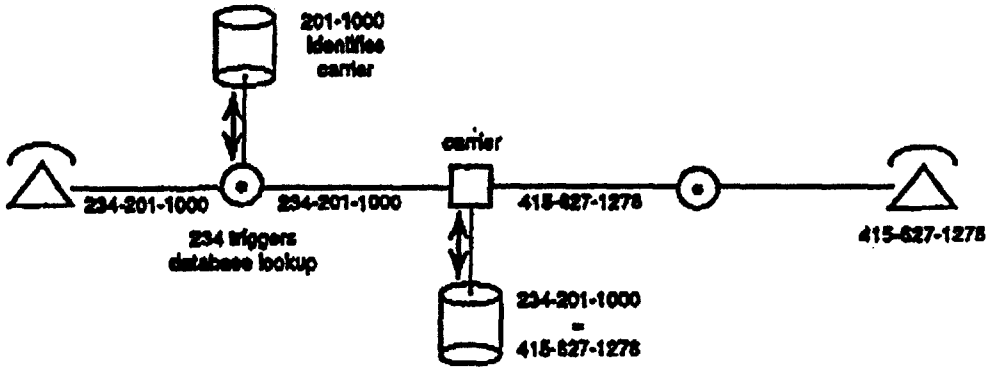
- Geographic
- Personal Communications
- SACs
- Unforseen Applications
- Reserved for Format Expansion

Appendix F

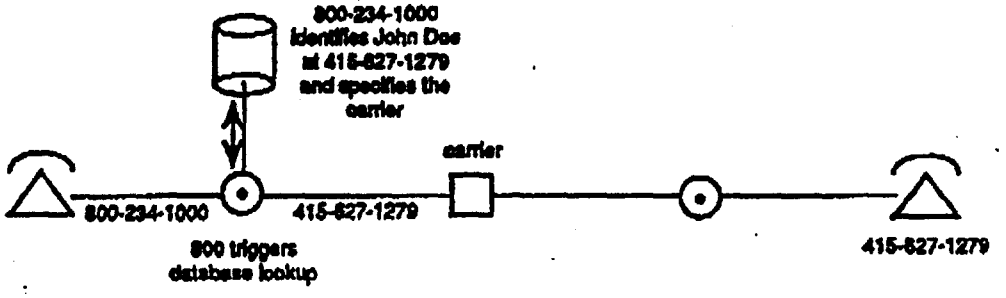
Diagrams for Indirect Addressing

- NANP-wide / nationwide database

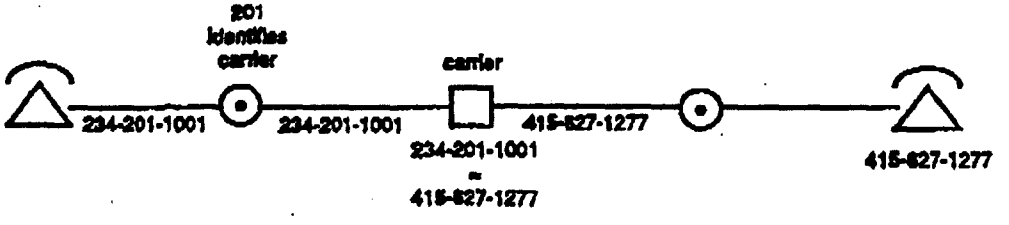
  - Personal communication services (with NANP-wide / nationwide and service provider databases



  - 800 database



- NNX plan



Appendix G

Proposed Plan For Eventual Digit Expansion

It is anticipated that the availability of NNX codes will provide numbering capacity to meet service needs in the NANP well beyond the study period covered in this report, that is 1995-2025. Nevertheless, it is expected that eventual expansion of the basic 10-digit number length by one to four digits will be found necessary. It is, accordingly, incumbent on planners to provide capacity for a conversion plan, even though details may not be provided until a later date. Specifically, a means to effect a phased conversion is essential.

A general contingency plan must begin by retaining the then current plan (at the future time of need), while providing for the gradual introduction of an expanded plan. This does not preclude other possibilities, including, for example, a mixed 11-digit, 13-digit plan. Unless future address input procedures leave no doubt as to when dialing of a number is complete, the early input digits must continue to provide a flag. Some new services may well contain protocol provisions defining number length without analysis of leading digits, but a mechanism for determination that dialing is complete, without recourse to timing, must be available until it is assured that no residual need remains.

Two format options suggest themselves. On the one hand, the D-digit of the current 10-digit format is not allowed to take on values 0 or 1. Either or both of these digits could serve as the required indicator that 1+NXX-NXX-XXXX was not intended whenever the valid alternative 1+NXX0-NXX-XXXX had been chosen instead. On the other hand, today's area codes never admit an N digit as the middle digit. If one such N-value, say 6, were reserved (calling for eighty N6X codes to be set aside), then a 1-9608-758-XXXX dialing sequence could be set equal to 1+908-758-XXXX.

The latter approach need not rely on a single N-digit value, but could distribute the same quantity of reserved codes (80) in eight groups of ten such as with: 220 to 229, 330 to 339, ..., 990 to 999. The correspondences would match 220 with 220X, 221 with 221X, and 990 with 990X, etc., thereby establishing the increased digit length. Inspection of 220X could allow length variations by code.

Whether a 1-digit or a multi-digit expansion is justified probably can not be determined at this time, and need not be. What is required is a reservation of code space. The first plan may appear more straightforward, but sacrifices office code space within the 10-digit format, accessible perhaps by the year 2000, for areas using 10-digit-only SACs or densely populated metropolitan areas with 10-digit-only overlays. Selective application of "NXX-XXX-XXXX" format compliance could be introduced with modest development effort. The ABC digits would dictate which D-digit continuations were allowed to have values 0 or 1, as well as other decimal values. An immediate decision is not required; telecommunications sector analysis and study is required, but a reservation of 80 codes in blocks as illustrated is recommended.

Appendix H

Long-Term Numbering Plan (LTNP) Interview Process

During the second half of 1990 the NANPA conducted telecommunications sector interviews of experts and futurists in the field of telecommunications. It was intended, and every effort was made, to obtain interviews representative of the broad and diverse segments of the telecommunications sector. In some cases, interviews were denied on either the basis of availability or the perception that the information sought by the NANPA was proprietary. In an effort to address the latter, the NANPA committed to keeping proprietary the specific comments of those interviewed. Attachment A contains a list of entities and futurists/experts that participated in the interview process.

In most cases, the interviews took approximately 2 hours. The discussion, in all cases, was frank, cooperative, and very informative. In order to assist discussion, a list of questions was sent to each person to be interviewed in advance of the interview. The questions were not provided for answer during the interview, but only to assist the person to be interviewed in preparing for the areas to be discussed during the interview.

The NANPA expresses sincere appreciation for those agreeing to be interviewed. This project would not have been nearly as successful without their thoughtful input.

At the end of the interview process, the NANPA consolidated the views expressed by those interviewed into a list of perceptions and issues derived from the interviews. Where there were conflicting views expressed by those interviewed, it is evident. Otherwise, those interviewed were generally in agreement with the perceptions and issues. Attachment B contains select concerns and general conclusions derived from the interview process. For those interested, a more detailed analysis is available from the NANP Administrator by calling Jean Mobley on 201-740-4661.

Appendix H (Attachment A)

LTNP Interviews - by Industry Sector

World Zone 1:

Interexchange Carrier:	AT&T:	Bob Lucky
	MCI:	Henry Sinnreich
Local Exchange Carrier:	Ameritech:	Joel Engel
	BellSouth:	Don Jones
	GTE:	Leland Schmidt
	Pacific Bell:	Mike Bandler, Marty Kaplan
	USTA:	Paul Hart
Canadian Carrier:	Bell Canada:	Hugh Burrows
	Telecom Canada:	Bob White & staff
Research/Association:	AT&T:	Bob Lucky
	Bellcore:	Irwin Dorros, Gary Handler, Bob Whitefleet, Gary Herman, Steven Minzer, Bob Keevers, Phil Porter, Ming Lai
	BNR:	John Luetchford
	SRI:	Edward Means, Tom Mandel, Linda Bruns
Government Agency:	FCC:	Peyton Wynns, Ken Stanley, Jerry Vaughn
	NTIA:	Bill Maher
	State Department:	Earl Barbely
	Canadian Department of Communications:	Dorothy Phillips, Thomas Whalen, Andrew Patrick
Vendor:	AT&T:	Bob Lucky
	IBM:	John Felton, Terry Smetanka, Norman Cowder
RCC:	CTIA:	John Stupka
	SWB Mobile Services:	John Stupka
	Telocator:	Tom Stroup
	McCaw Cellular:	Nicolas Kauser

International:

Carrier:	Australia Telecom:	Cliff Mathieson
	British Telecom:	David Halliday, David Leakey
	Nippon T&T:	Yoshimasa Tokui
Research/Association:	CCITT:	John Tar
	Ovum (Great Britain):	Claire Milne
Government Agency:	Oftel (Great Britain):	Geoff Knight

Appendix H (Attachment B)

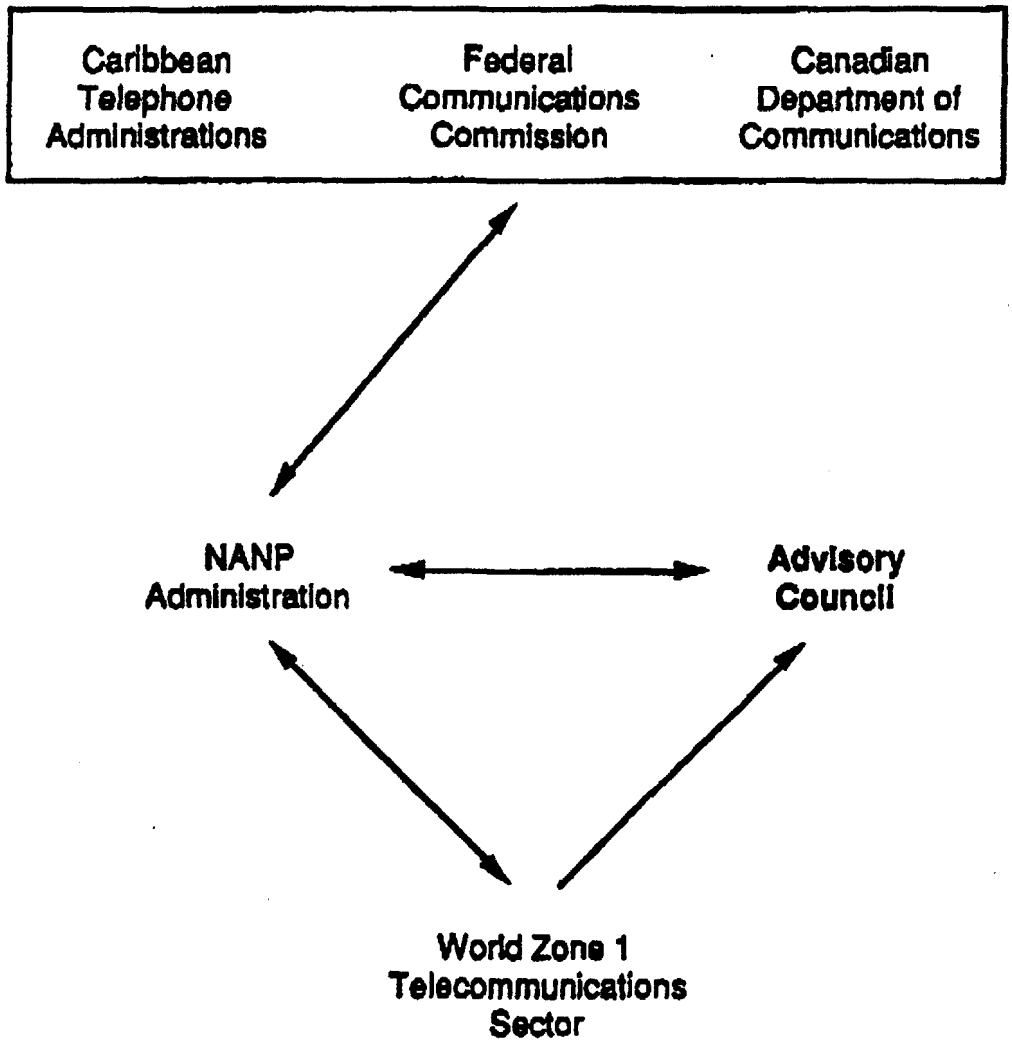
Perceptions and Issues Derived from LTNP Interviews

OVERVIEW

- General Concerns Regarding The Development of a LTNP:
  - Can not presume to offer a stable prediction for 30 years hence.
    - Current knowledge insufficient.
    - LTNP must be a flexible and "living" document.
    - Must identify and recognize alternatives.
  - Ensure adequate representation of industry sectors in the data gathering process.
  - Identify the process most likely to gain industry and regulatory support for the proposed LTNP.
  - Topic of most interest to those interviewed: Personal Communications.
  - Let moderation prevail, not grandiose predictions.
- Select General Conclusions From Interviews:
  - All aspects of society will become increasingly decentralized.
  - Equally sophisticated capabilities will be required for home, office, and mobile telecommunications.
  - Personal communications will be both a wireline and wireless service, with wireless as as adjunct to, not a replacement for, wireline.
  - Intelligent Network is the platform for the future.
  - A seamless/virtual seamless network is required to ensure ease of user access and interworking in a multi-vendor environment.
  - The level of cooperation between industry entities will ultimately determine the business success of the North American industry.
  - Competition is here to stay, the degree of regulation is less predictable.
  - The future requires flexible charging with integrated billing.
  - Fixed and mobile addresses will coexist for the foreseeable future.
  - By 2020, a user interface, not the user, will likely perform network connectivity and addressing functions.
  - Numbering must be an enabler, not an impediment.

Appendix I

Advisory Council Interworking



This diagram depicts the flow of issues and information into and out of the Advisory Council.

Appendix J

Glossary of Acronyms

B-ISDN	Broadband Integrated Services Digital Network
BNR	Bell Northern Research
CAC	Carrier Access Code
CC	Common Control or
CC	Country Code
CCITT	International Telegraph and Telephone Consultative Committee (translated from the original French: Comite Consultatif International Telegraphique et Telephonique)
CIC	Carrier Identification Code
CLC	Carrier Liaison Committee
CO (code)	Central Office (code)
CRTC	Canadian Radio-television and Telecommunications Commission
CTIA	Cellular Telecommunications Industry Association
DDD	Direct Distance Dialing
DID	Direct Inward Dialing
DNIC	Data Network Identification Code
DOC	Department of Communications (Canadian)
DP	Dial Pulse or Dial Pulsing
DTMF	Dual-Tone Multifrequency
FCC	Federal Communications Commission
FGB	Feature Group B
HNPA	Home Numbering Plan Area
ICCF	Industry Carrier Compatibility Forum
IDDD	International Direct Distance Dialing
INF	ISDN Numbering Forum
INPA	Interchangeable Numbering Plan Area (codes)
ISDN	Integrated Services Digital Network
IXC	Interexchange Carrier
KBPS	Kilobits Per Second
KP	Keypulse signal
LATA	Local Access and Transport Area
LEC	Local Exchange Carrier
LTNP	Long-Term Numbering Plan
MFJ	Modified Final Judgement
NANP	North American Numbering Plan
NANPA	North American Numbering Plan Administrator
NPA	Numbering Plan Area
NTIA	National Telecommunications and Information Agency
PBX	Private Branch Exchange
POTS	Plain Old Telephone Service
PSDS	Public Switched Digital Service
PSTN	Public Switched Telephone Network
SAC	Service Access Code
SRI	Stanford Research Institute
SMDS	Switched Multi-megabit Data Service
SS7	Signaling System 7
ST	Start signal
SXS	Step-by-step
USTA	United States Telephone Association
VPN	Virtual Private Network
WZ1	World Zone 1